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Gaylord's Patent Coupling.

Ewbank, in his work on Hydraulics, gives America credit for some of the best modern improvements in hydraulic machines and apparatus for conveying water and especially for producing the first rivited hose invented by Sellers and Pennock. Of more recent invention we may add the the woven or seamless hose, also the India rubber and Gutta Percha hose. The effective value of hose and any portable or detachable tube or pipe for conveying water depends upon its attachment or coupling.

A good coupling should be of simple construction, easily connected and disconnected, and perfectly free from leakage when connected. In the coupling here illustrated, these important requisites are obtained. Fig. 1 represents it applied to a hydrant, and fig. 2 to a locomotive.

Figs. 3, 4 and 5 represent it in detail. The principal parts consist of a female socket A, and a male socket B. The male socket is provided in the part which enters the female one with an external circumferential groove *b*, having one side beveled, as shown in fig. 3, where a part of the female socket is represented as broken away to expose the said groove to view.

Within the female socket there is provided a flange *a*, which is made of a form to enter the groove *b* of the male one, and this flange is beveled on one side to fit the beveled side of said groove.

Opposite to the flange *a*, a screw C screws into a tapped hole in the female socket, and the inner end of this screw has its edges beveled like the side of the groove *b*.

The connection of the coupling is made by first placing the male socket into the female one, while the screw C is screwed far enough outward, then screwing in the said screw, which presses the flange *a* against the beveled side of the groove *b*, in such a manner as to produce between them a wedge-like action, by which the end of the male socket is forced tightly against the packing ring *c*, of leather or India rubber, at the back of the female socket; while the flange *a* acts thus on one side of the coupling, the beveled edge of the screw C acts in a similar manner against the beveled side of the groove *b*, on the opposite side, and in this way the end of the male socket is drawn close up to the packing ring *c*, all round, and a water-tight joint is made. The coupling is quickly disconnected by simply turning back the screw C out of the groove *b*. The sockets A and B may have the hose attached to them by a clamp E or ring D, slipped over the hose and secured.

In applying the coupling to a hydrant, the male socket is permanently attached, and when the female socket is removed, a cap, constructed on the same principle as the female socket, is put on.

Notwithstanding the great advantages of this coupling for fire apparatus, it is also the very best means ever discovered for connecting pipes or leaders of any kind for the conveyance of liquids or vapors. Gas pipes or street mains for water, or soil pipes for dwellings or factories, can have this improvement cast on the pipes, and neither hot lead or rope packing is required for making a perfect joint.

Gaylord's Patent Couplings for hose, engines, hydrants, railroads, ships, steamboats; steam, force and garden pumps, faucets for public and private buildings, gas and water pipes, hose pipes and hose of all descriptions, street washers, etc., are manufactured only by the "Gaylord Patent Coupling Company," Nos. 31 and 33 Dey street, New York.

Fig. 1

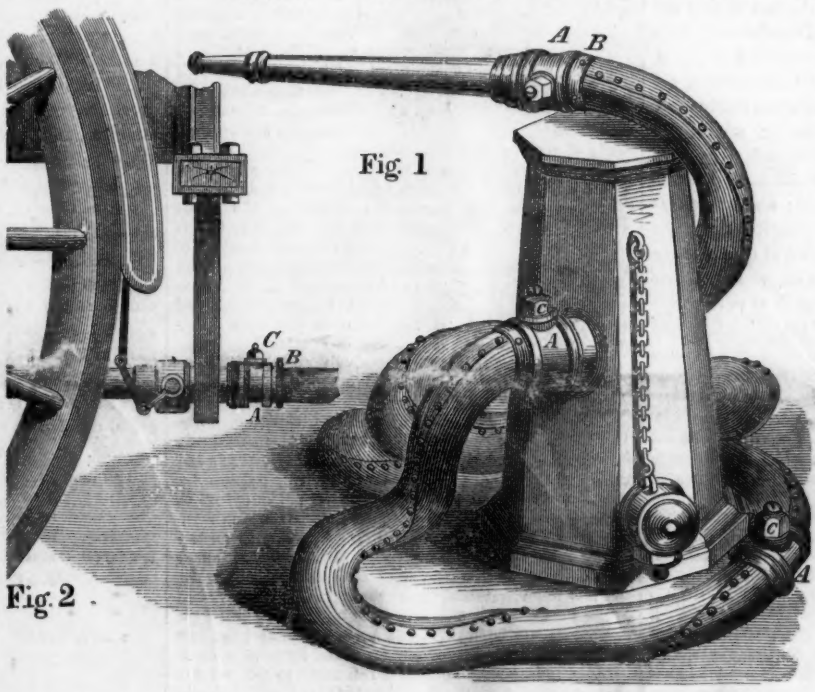
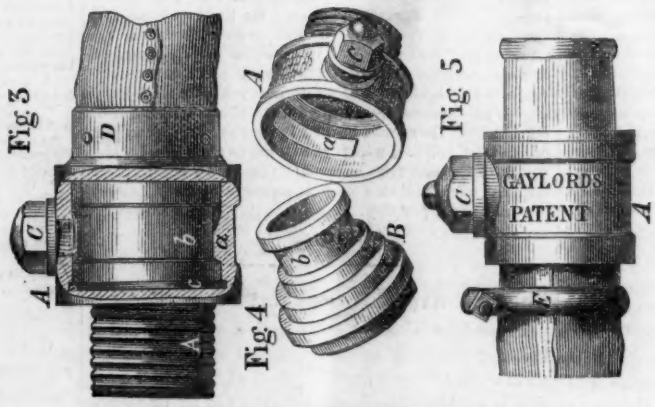


Fig. 2



GAYLORD'S PATENT COUPLING.

Concrete Fuel.

Heretofore, in order to cause small coal, or coal-dust to adhere so as to form solid blocks, it has been found necessary to introduce and incorporate with the coal-dust pitch, bitumen, tar, or some other adhesive substance. In order to mix these substances together and form the compound into blocks, expensive and cumbrous machinery has been required, and it has also been found necessary to heat and char, or partially burn the blocks The object of the invention of Mr. J. Roberts, of Cranmer-road, Brixton, is to cause the several particles of small coal to adhere together, so as to admit of the mass being moulded into the desired form. To this end he makes the small coal or coal-dust into a concrete mass, by the addition of pulverised lime and water. The lime may be added in various proportions, but he finds that from one-tenth to one-twelfth the quantity by measure of lime, well slaked with water, will be quite sufficient to form the coal into a hard concrete, but smewhat porous mass. The materials, when mixed, may be placed in wooden, earthen, metal, or other moulds, until the concrete becomes firm enough to be turned out to dry, for which purpose it will only be necessary to expose it to the air or wind for a few hours. The blocks will thus, in a day or two (without applying artificial heat), become hard enough to admit of moderately rough handling, and will burn with clearness and steadiness in any common grate or fireplace. He finds common lime answer the purpose of making a concrete fuel as well as any of the stronger and more expensive cements, and therefore, on account of its cheapness, he prefers to use it.—*Builder.*

The Water Supply of Our Great Cities.

BY REV. JOHN W. MEARS.

[Published by order of the Water Committee of the Councils of Philadelphia.]

It is a stream naturally of remarkable purity and sweetness, whose qualities are well known and esteemed among the people and manufacturers of Wilmington. Its waters might be reached and stored for the uses of our city at or near Downington. A stream so large and so available has obviously been left unmentioned by the engineer, on account of the vast manufacturing interest which would be destroyed by seriously diminishing the flow of its waters. But there is one objection alike applicable to the Brandywine and the five other tributaries of the Delaware, which have been mentioned; they all take their rise in Chester county, and from their sources to the points suitable for collecting their waters, they flow through some of the most highly cultivated and populous regions in the state or the country. Thus, one of the branches of Chester Creek rises in the borough of West Chester, and receives all the drainage of that large and well-cleansed town; and all of them must, more and more, assume the characters of sewers of the populous and fertile districts, through which they flow. The insignificance of these streams, too, is seen from the fact that if the head waters of them, except the Brandywine, were united in one engineering scheme, mentioned as practicable, but not recommended by Mr. Birkinbine, the resulting supply would be but one hundred million gallons per day—an amount for gathering which, we should hardly be justified in the great outlay required. If possible, we must build works which shall be sufficient for a generation or two to come; and it appears that if the demands of our city population for water increases for the next twenty-five years, at the rate they are now doing, we shall need at the expiration of that time, one hundred and fifty million gallons per day.

Passing now to the tributaries of the Schuylkill and omitting the inconsiderable streams upon the western side, we come first to the romantic Wissahickon. This stream rises in Montgomery county, and after running a most picturesque course of nineteen miles southwardly, it enters the Schuylkill four miles above Fairmount dam. The capacity of this stream alone is but little over one-fifth of that of the five united tributaries of the Delaware already described. There is little danger therefore that its attractions for pleasure-seekers, or as a seat of numerous mills and factories, will be interfered with. Three other streams intervene before we reach the largest tributary received by the Schuylkill in all its course; a stream larger than all of the five tributaries of the Delaware combined. This is the Perkiomen, which takes its rise far away in the hill country of Berks county, among the wild and romantic glens of South Mountain. Touching upon portions of Lehigh and Bucks counties, and traversing the northern portion of Montgomery county in its course, it empties into the Schuylkill three miles below Phœnixville.

This is a stream of the most interesting character. Its course is mainly through a rough, unproductive country, until within six or seven miles of its mouth. The rocky character of its banks protects it from the disturbing effects of freshets. It was after a season of protracted, heavy rain, that we first visited this stream. A most excellent opportunity was afforded us of contrasting the widely different effects of the freshet upon two streams in close proximity, but widely different drainage. Our road lay across the Skippack, a large and sluggish tributary, which enters the Perkiomen near its mouth. This stream we found nearly the color of chocolate. In a few moments we were crossing the main stream, on one of those magnificent stone bridges, which, after nearly a hundred years, remain the delight of the traveller and the engineer alike. The contrast in the appearance of the stream was really astonishing. There it flowed, comparatively bright and pure, innocent of all signs of freshet, save in the fullness and rapidity of its waters, limpid as those of a mountain torrent. The reason for the difference is obvious. The Skippack flows through a cultivated region, the geological character of which is the presence of red shale, while the water-shed of the main stream and higher tributaries of the Perkiomen is little cultivated, and is marked by hard sandstone and still harder trap-formation, the best guarantee in the world for the crystal purity of the water it retains.

It is, of course, *above* the mouth of this turbid tributary—to which we owe much of the discoloration of the Schuylkill during a freshet—that the works for the supply of the city are contemplated. The area of surface drainage upon which we should thus depend, and from which the creek and its tributaries would gather up the rain fall, would be no less than two hundred and twenty square miles. Plant one limb of the dividers at the point of junction of Bucks, Lehigh, and Montgomery counties: extend the other limb westward, so as nearly to reach Boyerstown; with this radius of about eight miles, the circle drawn around the point of junction of the counties named, will indicate, with tolerable accuracy, the section of country, including the corners of Berks, Montgomery, Lehigh, and Bucks counties, from which our city will draw the vital element so necessary to the wealth and prosperity of the prospective millions of its population. Compare these remote corners of territory with the districts through which flow the tributaries of the Delaware, already considered. A glance at the map will show that they are widely different in the single item of roads, being almost devoid of these means of communication; on the other hand, a perfect net-work of roads covers Chester county, in which all those six streams take their rise. Barren, rocky, and broken, these out-of-the-way sections are avoided by the great currents of population, and seem formed and located by the hand of Providence comparatively near to our doors, for the very purpose of treasuring up the dews and rains, in diamond purity and healthfulness, for our use.

Now let a line be drawn from the centre of our imaginary circle, out toward the ocean—it will be seen that it may be extended due east, with room for a northward sweep, until it reaches the coast, without meeting any elevated land. Carry the outer end of the line downward, through ninety degrees of the compass, and you will find it still passing successively over tracts of low and flat country, over which the winds from the rainiest quarters, east, northeast, and southeast, can blow without interruption, and retain their stores of moisture, until they reach the hillsides and ravines of the South Mountain range, 900 feet above the tide. There they must yield up a portion of their treasures, and there the head waters of the Perkiomen are nestled, ready to receive their contents.

The most satisfactory way to ascertain the amount of water which the Perkiomen could be relied on to supply, would be to measure the stream at the point where it is proposed to gather its waters. But this is an expensive undertaking, requiring the construction of a dam—for which the funds have not been appropriated by the Councils—and years of observation. Recourse must therefore be had to a system of calculations based upon the average annual rain fall over the region drained by the stream.

The rain fall of this comparatively uninhabited region is unascertained, but we have every reason to suppose it much larger than in the level regions to the east and the south. However, Mr. Birkinbine, to be on the safe side, has taken the average ascertained rain fall in this city, for the past thirteen years, about 45¼ inches per annum, as the basis of his calculations for the Perkiomen region. The next step in the process is, to estimate the proportion of the rain fall which actually passes into the channels of a stream in a given territory. This is a very difficult point to settle. There are losses by evaporation and by absorption into the soil and the vegetation of the country. The water-shed of the Perkiomen is well wooded, and the evaporation is comparatively light; the banks are steep, and the flow of water into the channels is rapid and large; the character of the underlying rock is retentive, so that a large part of the rain fall is doubtless utilized and brought into the stream. Taking the average of a number of observations made in connection with the actual water supply of twelve cities of Great Britain, as a certainly safe guide, Mr. Birkinbine allows for the loss of half of the rain fall in the region by evaporation, &c.; the remaining half leaves us a body of water nearly two feet in depth, spread over the 220 square miles of country drained by the head waters of the Perkiomen. A very simple calculation then brings us to the gratifying conclusion that there will be a daily average supply of 240 millions of gallons, which can be made available for the wants of the city; an amount sufficient to supply four millions of inhabitants with an average of sixty gallons of water each, per day.

(To be continued.)

Shrewsbury's Nonpareil Gas Boiler.

To produce a thoroughly effective and inexpensive boiler adaptable to every description of hot water apparatus—from the complex system of pipes in a mansion to the simple arrangement required for heating a small conservatory—is the important mechanical problem which Mr. Shrewsbury has satisfactorily solved, after much thoughtful and tentative work. His "Nonpareil Gas Boiler" is an invention of which we can speak in terms of unqualified approval, as we are convinced that our readers, after examining the whole contrivance, will admit that it is a striking and admirable example of the concentration of good means for obtaining a certain result. The fuel employed for heating the boiler is gas, and the arrangements for burning it involve several ingenious modifications of the gas apparatus hitherto used. The gas furnace and the actual boiler are enclosed in a stout sheet-iron case, and the gas flames are so disposed that their heat is profitably expended in raising the temperature of the water, and cannot act directly on the outer case or on the pipe through which the products of combustion are conveyed, consequently the external parts of the contrivance never get too hot. The boiler itself is cylindrical, and has a tube or several tubes running through it. These tubes are bottle shaped, that is to say, they are wide below and contracted above. The boiler and its tubes are of cast-iron. The gas burners are placed directly under the bottle shaped tubes, so that the greater part of the heat generated by the combustion of the gas must be expended in raising the temperature of the water surrounding these tubes. To prevent any serious loss of heat by the escape of the hot air through the contracted orifices of the tubes, a separate case containing non-conducting materials is fitted above the boiler, and is so constructed that it absorbs the heat arising from the tubes and radiates it back to the boiler. The amount of heat that eludes this ingenious trap is so small that the pipe provided for the escape of the products of combustion never gets unpleasantly hot. The burners are constructed on the principle of the Bunsen burner, and give perfectly smokeless and intensely hot flames, in which atmospheric air and coal gas are consumed together. Unlike the ordinary air burner however, Mr. Shrewsbury's patent burner requires no attention, and always gives a pure blue flame, free from any unpleasant smell. The holes for admitting air at the bottom of the burner are so constructed that the gas cannot be ignited in the tube by holding a light close to these holes. The burners are screwed into a flat gas-tight iron box at equal distances from the supply pipe, so that there is the same pressure of gas in each burner. This gas box is an important part of Mr. Shrewsbury's invention, for when several burners are fixed in a coil of tube in the ordinary way they necessarily gives flames of different magnitudes. The box with its burners is made to turn on a swivel, and swing out of the door in the outer case for the convenience of lighting. Some of the larger boilers have six tubes, and as many burners or groups of burners. The smallest size has only one tube.—*Ironmonger.*

Prices and Quality of Gas in British Towns quoted below

NAME OF TOWN.	Maximum price per 1,000 ft.	Minimum price pr 1000 feet.	Minimum illuminating power of a burner consuming 5 feet per hour.	Average price of coals & cannel pr ton.
Birmingham	2s. 9d.	2s. 5d.	14 candles	12s. 6d.
Blackburn	4 0	3 9	22⅔ "	14 0
Brighton	3 6	3 6	14 "	17 2
Derby	3 5	2 11	14 "	10 4
Edinburgh (old Co.)	4 10	4 4¾	28 "	19 0
Glasgow (old Co.)	4 2	3 6⅔	27 "	17 10
Ipswich	3 9	3 9	14 "	14 0
Leicester	3 6	3 1	14 "	15 0
Liverpool (in borough)	3 0	3 0½	22 "	
" (out of borough)	3 4	3 3½		
Manchester (in borough)	3 2	3 1½	17 "	13 4
" (out of borough)	3 8	3 7½		
Nottingham (in town)	3 0	2 9½	16 "	11 11
" (in outskirts)	4 0	3 9½		
Plymouth	2 9	2 9	12 "	16 10
Preston (in borough)	4 2	3 4½	18 "	11 4
" (out of borough)	5 0	4 6½		
Rochdale (in borough)	4 0	3 3½	21 "	15 10
" (out of borough)	4 6	3 9½		
Salford (in borough)	3 4	3 4½	20 "	
" (out of borough)	4 8	4 8½		
Sheffield	3 6	3 0	14 "	9 7½
Stockport	3 6	3 0	22 "	16 6
Walsall	2 8	2 4	12 to 14 "	11 4

GAS METERS AT THE PARIS EXPOSITION.—A correspondent of the *Builder* says: The meters are in great force. Messrs. Defries exhibit their dry gas meter; the London and Oldham Gas Meter Company show not only gas meters, but experimental gas apparatus of various kinds, and also Payton's simple and beautiful cycloidal meters, for measuring water and other liquids. Messrs. G. Glover & Co.'s well-known gas transferer and dry meters; Newton & Braddock, of Oldham, dry gas meters, and the well-known dry gas meter of Mr. Thomas Glover, of Clerkenwell, with gas holders and other apparatus by the same.

On the Application of Liquid Hydro-Carbons as a Substitute for Cannel in the Manufacture of Gas of High Illuminating Power.

[Read before the British Association of Gas Managers, at Nottingham, by Mr. E. Goddard, Engineer to the Ipswich Gas-Light Company.]

[From the London Oil Trade Review, June.]

The subject which I have ventured to bring under the consideration of this meeting is of the greatest importance at the present time. In the early history of gas lighting oil and fatty matter were extensively used in the manufacture of gas, and while a very superior illuminating agent was produced it was soon found to be so costly, as compared with the use of coal, that it was abandoned as being commercially unprofitable. Of late the demand, both by the public and the Legislature, for gas of a higher illuminating power than can be produced from ordinary gas coal has led to the adoption of a portion of cannel with the coals until its use has become a necessity with those companies which are required by their acts of incorporation to supply gas of a certain standard of illuminosity. The cannel coal measure being comparatively limited, the increased demand has resulted in a corresponding increase in price; and the recent application of cannel in the manufacture of petroleum has still enhanced its value. It therefore becomes a matter of grave inquiry how gas of high illuminating power is to be produced at such a cost as will yield a profit to the gas companies, who, whatever may be the cost of production, are limited as to the price at which it shall be sold to the public. The waste products from the oil works, in combination with coal, have been employed as a substitute for cannel, and it is the purpose of this paper to direct attention to some of these materials. In the rectification of cotton-seed oil the residue is employed in the manufacture of stearine for candle-making, and the refuse from which, known in commerce as cotton-seed pitch, produces gas of great illuminating power and in large volume.

The result of experiments with this material has been furnished to me by Mr. Crow, as follows: One ton of cotton-seed pitch will produce 22,000 cubic feet of gas, equal in illuminating power to thirty sperm candles, each consuming two grains per minute. But the supply of this material is too limited to come into general use. In many parts of the country is to be found in immense quantities schist, or schist clay, commonly known as shale, from which oleaginous matter can readily be produced, and letters patent have been recently taken out by Mr. M'Kenzie for utilising this oil in the production of gas. The invention consists in minutely pulverising one ton of bituminous coal, or duff, and intimately combining it with, first, twenty-five, thirty, or thirty-five gallons of crude shale oil or petroleum; or, secondly, with one half of these oils mixed with one half of what is known as bottoms, or residue, in the distillation of these oils, partly with the view of taking off the water from the oil and thoroughly mixing the thick residues with the light oils, and also partly to produce a quicker and more complete combination of the oil with the coal. Mr. M'Kenzie slightly heats the oil, and in that state, or shortly thereafter, thoroughly mixes and combines them. The quantities of oil used, whether 25, 30, or 35 gallons, are mainly regulated by the quality and quantity of gas desired from the material. If 18-candle gas or under be sought, 25 gallons of oil are used; should 24-candle gas or under, 30 gallons are used; and if over 24-candle gas, 35 gallons are used. It may be that an oil or coal deficient in the properties desired will require two to five gallons more oil, but that we understand to be the extent of the variation. If petroleum be used instead of shale oil, the results will be better, but there is so little difference that, commercially, shale is the better oil for the purpose. The only other element in the manufacture is the pulverization of the coal. If the minimum quantity of oil is to be used, the coal requires to be ground a little rougher than when thirty gallons are used, while if thirty-five gallons are to be used it requires to be very fine. The reason for this, we understand to be, that the greater the quantity of oil the finer must be the particles of the coal, so that the oil may be absorbed. If 35 gallons of oil were put into coal adapted for 25 gallons only, there would be condensation, and the gas would not be permanent to the extent to which the coal could not absorb thoroughly the oil. While the result would be good, it would be much less satisfactory, and would raise doubts as to the permanency of the gas produced. There is no peculiarity about the use of the material. It is charged in the usual way, but requires a little less time in the retorts than ordinary coal; the only thing requiring care in its treatment when first used at any works is that the ascension pipes be thoroughly cleaned. As to the results secured, these have been reported very high, varying from 12,000 to 14,000 cubic feet per ton, according to the quantity of oil used, the illuminating power of the gas being from 18 to 20-candles. The coke produced is of first-rate quality, and this forms one of the valuable features of the invention.

Letters patent for accomplishing the same object have been secured by Mr. John Hamilton, in which crude oil (creosote), or other mineral oil, together with a small portion of napthaline are boiled, and whilst in a hot state are poured over a quantity of sifted or pulverised coal known in the trade as "coal duff"; coal, culm, or other pulverised coal may be used. The mixture may be made in a pug mill, or other suitable mixing machine, and is then allowed to stand for twenty-four hours, or thereabouts, so as to permit a complete combination of the gases of the coal with those of the oil and napthaline. The result is an artificial gas-producing material, and the following proportions are found to produce good effects: One ton of coal, 20 to 30 gallons of coal oil and 5 lbs. of napthaline. From this mixture the patentee states that he has obtained 15,000 cubic feet of gas of high illuminating power. The licence for the sole manufacture of M'Kenzie's patent material has been secured for England by Mr. Thomas Vaughan, of Middlesborough, who is now erecting large works at Merton, near Seaham Harbor, who will be able shortly to supply the material equal to the best boghead cannel at about half the price of cannel.

Several attempts have been made to employ petroleum instead of coal for the production of gas; and in the State of New York, and other parts of America where petroleum is very cheap and coals expensive, the experiments have proved very satisfactory. The process employed at Homer and Courtland, in the State of New York, may not be without interest to this assembly. At Homer two retorts were fixed, of the following dimensions: length, 7½ feet; breadth, 16 inches; height, 12 inches. Two vertical pipes are cast on each retort for the purpose of supplying water and petroleum. The retorts are placed horizontally in an arch, exactly the same as ordinary coal-gas retorts, for which they can be substituted without much trouble or expense. Each retort is divided into three chambers, called the petroleum, the water and the coke chambers respectively. Petroleum and water are introduced in continuous streams through the tubes before described, so that when once a barrel of petroleum is placed at a sufficient height to allow a pipe provided with a stop-cock to feed the retort, the fluid may be admitted, and the process of conversion into gas goes on without further trouble until the barrel is exhausted. Each retort will produce about 500 cubic feet of gas per hour, and eleven gallons of petroleum are consumed in the production of 1000 feet of gas; but as this gas has at the least three times the illuminating power of ordinary coal gas, it will be seen that two petroleum retorts of the same dimensions as coal-gas retorts, will yield in twenty-four hours 24,000 cubic feet of petroleum gas, the equivalent of 72,000 cubic feet of coal-gas, or as much as twenty four ordinary retorts, charged with 150 lbs. of coal each every five hours, can produce in twenty-four hours. This advantage in favor of petroleum gas refers only to America, where coal gas is much more expensive, and petroleum much cheaper than in this country.

Proportions of the Human Figure.—The proportions of the human figure are strictly mathematical. The whole figure is six times the length of the foot. Whether the form be slender or plump this rule holds good. Any deviation from it is a departure from the highest beauty of proportion. The Greeks make all their statues according to this rule. The face from the highest point of the forehead where the hair begins, to the end of the chin, is one-tenth of the whole stature. The hand, from the wrist to the end of the middle finger is the same. The chest is a fourth, and from the nipples to the top of the head is the same. From the top of the chest to the highest point of the forehead is one-seventh. If the length of the face, from the roots of the hair to the chin, be divided into three equal parts, the first division determines where the eyebrows meet, and the second the place of the nostrils. The navel is the central point of the human body, and if a man should lie on his back with his arms extended, the periphery of the circle which might be described around him, with the navel for its center, would touch the extremities of his hands and feet. The height from the feet to the top of the head is the same as the distance from one extremity to the other when the arms are extended. These are the general measures of the species.

New Process for Preparing Tin Plates.

An important invention has just been added to the numerous list, having reference to the manufacture of tin plates. It is that of Mr. T. F. Parsons, of Maindee, and is one the advantages of which must strike the reader at a glance. It proposes to abolish sulphuric acid from the preparation of tin plates, substituting cleansing by friction.

In the process usually employed for preparing plates for being plated or coated with tin or its alloys, the oxide, and the cinders, and other impurities adhering to the plates, are removed by the action of sulphuric acid only, whereby, it is alleged, not only a very considerable outlay is involved, but the plates become corroded, and retain their corrosion in the pores of the iron, notwithstanding all the washing and squeezing to which it is afterwards subjected.

The mode of cleansing adopted by the patentee of the new plan is by simple friction on the surface by which he makes the plate clean, smooth, and bright, the friction taking place in pure water. It is then fit to be coated, and on the white tin being applied to an already bright surface, highly reflecting power is obtained, while no particles of acid are left behind to eat it away with rust, or to cover its surface. The cleansing is carried on by means of a machine, composed of "guide" or "feed" rollers, that are used to govern the passage of the plate through a pair of polishing rollers, which, revolving at a great velocity, produce cleanness and smoothness of surface. The machines, we are informed, cost about half as much as one pair of cold rolls at present cost, and two boys can work them readily. They are so constructed that they can either be fitted with a pair of cold-rolls, and thus turn out the plate complete for tinning, or the polishing rolls only may be fixed to existing cold rolls, two boys only being required to work the whole, as at present—one "feeder" and one "receiver." It is expected by the patentee, in addition to the saving caused by the abandonment of the "Black Pickle" and its concomitant expenses, that one annealing and one cold-rolling (instead of two) will be sufficient to produce a plate more healthy, more durable, and with higher reflecting power than can be obtained by the present process.—*The Ironmonger.*

Brevities.

—A lump of solid Montana silver weighing seventy-three pounds is on exhibition in St. Louis.

—Five mills in Gilpin county, Colorado, turn out bullion to the value of $1,500,000 per year.

—Colorado has 20,000 inhabitants, and a newspaper for every 9,000 of them.

—Iodide of silver possesses the singular property of contracting by heat and expanding by its withdrawal.

—The income of McCormick, the noted patentee of the reaping machine, was last year, $169,760.

—All varieties of bitumen, such as asphaltum, elastic bitumen, caoutchouc, etc., are found in Tennessee and Northern Alabama.

—An order was lately received in San Francisco from Japan for $10,000 worth of leather, to be used for military accoutrements.

—A large paper manufactory is to be erected in Camden, Me. The town has voted to exempt it from taxation for five years.

—The manufacture of the Low-water Reporter is soon to be commenced at Newburyport. The company owning the patent has a capital of $40,000.

—The Spring Valley Water Company in San Francisco, Cal., have declared their usual monthly dividend of one half per cent., amounting in the aggregate to thirty thousand dollars.

—C. L. Alexander, of Washington, D. C., has invented a new type case "having the lower or front side of the boxes inclined toward the upper or rear part of the case."

—A chime of 42 bells, to be placed in the Exposition, is played like a pianoforte with perfect ease, to any tune. Four years were spent in the construction of the instrument.

—The Charlestown Drain pipe works employ twenty-five hands, turn out 6,000 feet of pipe per week, using 2,000 tons of New Jersey clay and 75 tons of Albany glazing clay a year.

Chemistry, as Applied to the Manufacture of Coal Gas.

BY DR. FRANKLAND, F.R.S., F.C.S., ETC.

Professor of Chemistry at the Royal Institution.

REVISED AND EXTENDED FOR THE FOURTH EDITION,

BY DR. ATTFIELD, F.C.S.,

Director of the Laboratories of the Phadmaceutical Society of Great Britain.

[From "Clegg on the Manufacture of Coal Gas."]

The processes used in the manufacture of gas for illuminating purposes are in their nature essentially chemical; a certain amount of chemical knowledge is therefore absolutely requisite in carrying on the various operations of such manufacture in the most satisfactory and economical manner. This amount of knowledge may be attained without a thorough acquaintance with the whole of the laws and doctrines of chemical science; it is therefore only necessary, in this work, to bring prominently forward the properties and reactions of such substances as are of present interest and importance to the gas manufacturer, or which are likely to lead to the future improvement and perfection of this important branch of industry.

Chemical Affinity.—When a piece of phosphorus is exposed to the air it emits a white smoke, which is luminous in the dark; the phosphorus gradually disappears, and if the experiment be conducted in a dry glass vessel the latter will be gradually become coated with a white powder, which on further examination will be found to be a compound of phosphorus and oxygen.—Here, then, the phosphorus has combined with one of the constituents of the air, oxygen, to form a white pulverulent compound called phosphorus acid, and the force or tendency which thus determined this union is termed the *chemical force* or *chemical affinity.* It is the study of the phenomena produced by this force and the laws by which its operations are regulated, that constitute the science of chemistry.

The exertion of chemical affinity is generally rendered evident by very striking effects. It usually produces an entire change of properties in the bodies which are made to unite by its agency; thus in the instance just mentioned, phosphorus, a neutral wax-like highly combustible solid, insoluble in water, and oxygen, a colorless and invisible gas, by their chemical union generate phosphorus acid, a white solid, soluble in water intensely acid and incombustible; in short, a body in which the attributes of its component elements are entirely lost.

The exertion of chemical affinity is also usually attended by an alteration of temperature, and sometimes by the production of light and electricity. It is further distinguished from all other species of combination by the remarkable circumstance, that when bodies unite chemically they do so in certain fixed and invariable proportions. The elements of a compound body are always united in exactly the same ratio, whether the substance has been formed ages ago by the operations of nature, or but recently in the vessels of the chemist. Thus the elements of water—oxygen and hydrogen—are always united in the ratio by weight of sixteen parts of the former element to two parts of the latter; or by volume, of one volume of oxygen to two volumes of hydrogen. This combining weight, peculiar to each element, is termed the *combining proportions* or *atomic weight* of that element.

Two elements may unite in several proportions, but it is remarkable that those proportions bear a very simple relation to each other, whilst each variation produces a distinct compound which frequently bears no resemblance to the others. Thus, as we have already stated, sixteen parts of oxygen and two parts of hydrogen form water; but two parts of hydrogen can also unite with sixteen parts of oxygen, producing a liquid having very different properties, being highly corrosive, blistering the skin when applied to it, and exhibiting very violent reactions in contact with certain substances. Again, twenty-eight parts, or two combining proportions, of nitrogen unite with sixteen parts of oxygen; and the same weight of nitrogen also combines with double, treble, four times, and even five times this amount of oxygen, producing in each case a separate compound, distinguished from the rest by peculiar properties.

In the case of gases and bodies which are capable of being converted into the vaporous condition, the combining proportions by volume are equally simple. Thus, one volume of gas or vapor unites with one, two, or three of another, or in the proportion of two to three, etc. For instance, one volume of oxygen unites with two volumes of hydrogen to form water, but two volumes of oxygen combine with two volumes of hydrogen to form the corrosive liquid above mentioned.

We are however unable to convert many of the elements into vapor, and we cannot therefore experimentally ascertain their combining volumes. Under these circumstances we have to assume a combining volume, and in doing so are guided by the analogy between the non-volatile element and other volatile ones whose combining volumes we have actually ascertained. Carbon, for instance, has not hitherto been volatilized, but we assume that twelve parts, or one combining proportion, occupy the same space in the gaseous condition as sixteen parts, or one combining proportion, of oxygen; we therefore say that carbonic oxide gas, which consists of twelve parts or one atom of carbon combined with sixteen parts or one atom of oxygen, is composed of one volume of *carbon vapor* and one volume of oxygen; and that carbonic acid, which contains one atom of carbon and two atoms of oxygen, consists of one volume of carbon vapor united with two volumes of oxygen.

When two gases or vapors unite *chemically*, a contraction of volume usually ensues, but the resulting gaseous volume of the compound always bears a very simple relation to the volume of the two gases before combination. Thus, when one volume of oxygen unites with two volumes of hydrogen, the resulting watery vapor occupies two volumes; a contraction or diminution of volume has therefore occurred in this instance. Again, two volumes of carbon vapor unite with four volumes of hydrogen to form olefiant gas, which occupies two volumes, or exactly one half the space occupied by the hydrogen before combination.

The following diagram represents the composition by volume of all the compound gases and vapors which are of importance to the gas manufacturer. The column headed "before combination" represents the gaseous volume of the elements compasing such gas or vapor before their chemical union; and a comparison of this column with that headed "after combination" shows the amount of contraction which occurred at the moment of combination. The letters O, H and C are employed to indicate respectively oxygen hydrogen and carbon, O representing sixteen parts by weight of oxygen, H one of hydrogen, and C twelve of carbon:

	Volume before Combination.	*Volume after Combination.*
Vapor of Water	O H H	OH_2
Carbonic Oxide	C O	C O
Carbonic Acid	C O O	CO_2
Light Car. Hydr'n	C H H H	CH_4
Olefiant Gas	C H H / C H H	C_2H_4
Acetylene	C H / C H	C_2H_2
Propylene	C C H H H / C C H H H	C_3H_6
Butylene	C C H H H H / C C H H H H	C_4H_8
Napthaline Vapor	C H H / C H H / C C C H H / C C C H H	$C_{10}H_8$
Turpen'e Vapor	C C H H H H / C C H H H H / C C C H H H / C C C H H H	$C_{10}H_{16}$

(To be continued.)

Purification of Water.

[From the London Builder.]

INSTITUTION OF CIVIL ENGINEERS.

On May 21st, Mr. John Fowler, president, in the chair, the paper read, in abstract, was "Experiments on the Removal of Organic and Inorganic Substances from Water," by Edward Byrne. The object of these experiments was to try how far the statements generally made, with regard to the action of charcoal in purifying water, might be depended on.

It was stated that many substances were spoken of, as having a purifying effect on water, but of all, charcoal (especially animal charcoal) had been considered the most efficacious. Though in works which treated on spring and river waters, the assertion was constantly made, that both vegetable and animal charcoal (particularly the latter) removed the organic and inorganic substances found in waters, yet no experiments were given by which to judge to what extent these statements were true. With a view to ascertain whether water, uncontaminated by either decomposing animal or sewage matter, but containing dissolved vegetable matter, would contain any nitrogenous bodies, some bog water was procured which precluded the possibility of its containing any animal or sewage matter, the experiments on which served to prove that, in bog water at least, vegetable nitrogenous matter was present.

The details of four sets of experiments were given, the first on animal charcoal, of which nearly 5 lb., new and freshly burned, and of the degree of fineness used in sugar refineries, were packed in an ordinary stoneware filter. The water employed (of which a complete analysis was given) contained, in the gallon, organic matter, 10·80 grains; inorganic matter, 88 30 grains. The hardness of the water, before boiling, was found to be 50·50°, and after boiling, 33°; and the oxygen required to oxidize the organic matter contained in one gallon, amounted to 0·0116 grain. Several gallons of the water were allowed to percolate slowly through this charcoal, and upon examination afterwards, it was found that, of the inorganic matter which had originally existed, 52·60 grains were removed from the first gallon: but from each succeeding gallon less and less, so that, from the twelfth gallon of water that passed through the charcoal, only 8·80 grains of inorganic matter were removed. Of the organic matter 4·80 grains were removed from the first gallon; but, with a gradual decrease, the charcoal ceased to remove any organic matter after the sixth gallon. In fact, immediately afterwards, it commenced to give back a portion of the organic matter removed in the first instance, the quantity returned to the twelfth gallon amounting to 1·55 grain. Thus, of the 13·54 grains of organic matter removed by the charcoal from the first six gallons of water, as much as 4·98 grains of organic were given back to the next six gallons: from which the author concluded that, had this set of experiments been carried a little farther, all the organic matter removed at first by the charcoal would have been given back again.

The second and third series of experiments were with wood and peat charcoal, which, however, were still less satisfactory than those with animal charcoal. The fourth set of experiments was on animal charcoal, with water previously treated with permanganate of potash slightly in excess. After remarking that the water, in its passage through the charcoal, was found to contain organic matter, apparently in the same quantity as before treating it with the permanganate, attention was drawn to a comparison between the first and fourth sets of experiments, to show how closely they agreed to contradict the general statements made as to the removing power of charcoal, and to demonstrate how very little indeed could be done by this filtering material, even on a small scale, towards the purification of water.

GAS WORKS.—The Vallejo (Cal.) *Recorder* says the Ensley Gas Company have their mains all laid in Vallejo, and their works are approaching completion. About 400 lights have been engaged, which is nearly double the number the company expected to commence with.

Correspondence.

Gas Compared with Coal for Cooking.

(THE GAS PRODUCT WILL DO TWICE AS MUCH AS THE COAL.)

TO EDITORS OF THE AM. GAS-LIGHT JOURNAL:

Gas for cooking must be estimated by the amount cooked (and not by the hour, as nearly all persons acquainted with gas for lights are inclined to do); practically the nearest approximation is to estimate by the size of a family. From a series of calculations extending over a period of ten years, I find it averages about fifteen feet of gas per day for each person in a family, to do all the cooking, washing, and ironing, including wastage. The gas product of three bushels of coal averages one thousand feet, and will cook for a family of five persons fourteen days, for three persons twenty-three days, and for one person seventy days. Three bushels of coal will cook for a family of five persons seven days; for three persons ten days, and for one person twenty days, with the common cooking stove—the wastage with coal is the greatest. The economical ratio of gas is in favor of small families, while it is the reverse with coal.

It is undoubtedly certain, that the gas product of a bushel of coal will do twice as much cooking as the coal will do in the common way, and the coke product will do about half as much heating.

When cooking becomes general as lighting, the consumption of gas will be increased two hundred per cent; or where gas bills for lights are five dollars, add the cooking and it will be fifteen dollars; this increase does not cost one cent extra for meters, gas pipe, or collecting of gas bills. In manufacturing gas the expences decrease as the consumption increase. When cities or communities fairly understand the fact—that less than one half the coal will supply them, changes will be made in several departments; gas will be made so cheap that there will be no practical difficulty in having an ordinance obeyed prohibiting the burning of bituminous coal or wood, on account of the smoke nuisance; and it would also diminish the loss and accidents by fire thirty per cent.

H. B. MUSGRAVE, M. D.

Cincinnati, Ohio, July, 1867.

[The writer of the above correspondence has made the subject of utilizing coal gas for cooking and heating a study for many years, and the estimates he gives are the result of a great number of practical experiments. Dr. Musgrave is the inventor also of a portable gas cooking and heating apparatus, which produces a perfect combustion of the gas, thereby developing the greatest amount of heat. We have samples of this apparatus, and have satisfied ourselves by trial that it is all he claims for it. The Dr. desires to establish an agency in this city and throughout the United States. It may be seen on exhibition at 22 Pine street, N. Y., Room 9.—EDS.]

Chlorination of Auriferous Sulphurets.

The treatment of auriferous sulphurets by chlorination, originally introduced in Silesia by Prof. Plattner, is now practised to some extent in California and Nevada. It is an effective mode of securing almost the full assay percentage of gold when combined with sulphur, arsenic, antimony, etc. This is a feasible but not economical process unless in connection with a combition of favorable circumstances.

The affinity of chlorine for many of the metals is remarkable. Sulphur and antimony combine with it with ignition, and in contact with pulverized gold it forms a terchloride of gold without the application of heat, or at a low heat. Below red heat chloride of gold is formed; red heat expels the chlorine, leaving behind the metallic gold.

In chlorination roasting, the salt (chloride of sodium) has its sixty per cent. of chlorine set free by contact with the sulphates, these being formed through the previous oxidation of the sulphur or the sulphurets to sulphuric acid. Both the oxygen and sulphur composing the sulphuric acid are transferred to the sodium of the salt, while the chlorine combines with the freed metals or further decomposes sulphur, causing the latter to pass off as a volatile chloride of sulphur. By Plattner's chlorination, the chlorine is generated apart from the ores treated. The generator is partially filled with oxide of manganese and salt; sulphuric acid is then introduced, and by the application of heat the chlorine gas is evolved; a current of this gas is then introduced into the tubs containing ores which had been calcined until no odor of sulphurous acid could be detected. The resulting chloride of gold is soluble in water. Clean water is introduced into the tubs ten or fifteen hours after the chlorine gas. The water containing the dissoived chloride of gold is then discharged into glass vessels. In this process iron takes the place of mercury in amalgamation. Sulphate of iron precipitates the gold as a black-brown powder.

In Grass Valley, California, where free gold and sulphurets occur together, after the free gold is collected, the sulphurets are concentrated and subjected to the chlorination process. By this 90 per cent. of the gold is saved in iron and arsenical ores. It is especially well adapted to low grade gold. There are many circumstances which render it probable that this treatment could be advantageously employed on Colorado ores.—*Am. Exchange and Review.*

English Gas Coals.

The London *Gaslight Journal* says:

"It has transpired, in the course of the evidence adduced, that 1,072,908 tons of coal were consumed by the metropolitan companies in 1866; and to raise the standard of illuminating power to 18 candles would require the use of at least 500,000 tons of Wigan cannel (or the equivalent of that quantity of Scotch cannel), which is the total present yield of the Wigan collieries. More than half of it is now consumed in the gasworks of the neighboring towns, and the remainder is sent out of the district to raise the quality of gas in more distant towns to the standard of 14 candles, as prescribed in most of the gas acts recently passed. It is the increased demand for cannel produced by thus raising the standard of illuminating power which has been the chief cause of the advance in price that has taken place in Wigan cannel, amounting to 40 per cent. during the last few years; contracts having been renewed at 18s. per ton that were originally made at 12s. 6d. As the whole of the cannel collieries in that district have fallen into the hands of four or five bodies, there is at present no competition among them, and the prices must rise further with increased demand. In Scotland the same cause is operating to raise the price of cannel there. There are only four or five cannels out of upwards of twenty that are sufficiently rich in the yield of gas and products to compete in the London market with Wigan cannel; the products of the others being worthless, or the gas from them being little better than that of Newcastle coal. The owners of the richer descriptions are anxiously watching the proceedings of the committee on the Metropolis Gas Bill, knowing that if the quality of the gas is to be improved an immense rise must take place in the price of cannel, as the sources of supply are extremely limited. In Glasgow the cannel used by the old company has been raised 41 per cent. within two years—viz., from 14s. 12½d. per ton to 19s. 6d —and we understand that this year the entire profits have been absorbed by the rise in cannel! The price at present charged for gas is 4s. 2d. per 1,000 feet, with discounts to large consumers; but an advance on that price must be made to compensate for the increased cost of the materials of manufrcture."

Coal Market.

We have been kindly furnished with the following quotations of coal by Messrs. Bird, Perkins & Job, 104 Wall street, New York, who deal in the coals quoted below:

NEW YORK, July 30th, 1867.

PRICES AT MINES—GOLD.

Picton, (coarse coal)	$2.25
Sydney (coarse coal)	2.25
Lingan (coarse coal)	1.75
Little Glace Bay (coarse coal)	1.87½
" " (fine coal)	1.00

FREIGHTS—CURRENCY.

Little Glace Bay to New York	$3.25
" " " Boston	3.00
Lingan to New York	3.50
" " Boston	3.00
Picton " "	2.75
" " Providence	2.87½
" " Warlham	3.00
Sydney " Boston	3.00
" " New York	3.50

Recent sales of Sydney coarse coal at this port were at $8.75—of Little Glace Bay, coarse, at $8.25 per ton.

New Roasting Furnace.

The Central City (Col.) *Register* says: We were shown, a few days since, drawings of a new roasting furnace, invented and being gotten up by Dr. Phelps, of Black Hawk. It is a sort of terrace furnace. The hearth is, to use a homely illustration, a flight of broad stairs, with each stair inclining forward. The fire chamber is at the bottom of a series of terraces, and the flame and heat from it passes upward and over them as through a flue. The ore is admitted at the top through a hopper, and is heated and roasted as it descends from one terrace to another, by its own force of gravity, just as a ten-pin ball would if dropped on the upper one of a flight of stairs. The ore is roasted both as it passes along the broad inclined plane of each terrace and as it falls from one to another, combining the principles of roasting in suspension, and as in a reverberatory furnace. At the base of each terrace a perforated pipe is introduced for the admission of air in superheated steam as may be desired. Thus, in falling from one terrace to another, the ore may be forced to pass through a jet of either or both of these desulphurising and oxydising agents, while the flame is continually passing up the terraces, instead of down, as the ore does. As the fumes of tha furnace leave the terraces they are compelled to pass through a spray of cold water, which condenses any of the valuable metals or minerals which may pass over, and even the sulphurous acids and native sulphur.

Useful Recipes.

RUBBER CEMENT.—Caoutchouc 3 parts, naphtha 34—heated and stirred to solution, then add finely powdered shellac 64 parts.

GLYCERIN PASTE for office use may be prepared by dissolving one ounce of gum arabic and two drachms of glycerin in three ounces of boiling water.

WELDING COMPOSITION.—Fuse borax with one sixteenth its weight sal ammoniac, cool, pulverize, and mix with an equal weight of quicklime, when it is to be sprinkled on the red hot iron and the latter placed in the fire.

TO WASH CALICO WITHOUT FADING.—Infuse three gills of salt in four quarts of hot water: put the calico in while hot, and leave it till cold, and in this way the colors are rendered permanent, and will not fade by subsequent washing.

TO REMOVE STAINS.—Chloroform removes stains from paints, varnishes, and oils. Another very effective fluid for the same purpose, is a mixture of six parts of strong alcohol, three parts of liquor ammonia, and a quarter part of benzole.

ODOR OF FLOWERS.—Pure, inodorous glycerin will completely absorb the odors of flowers, if you submit them to a digestion for several weeks in a well-closed jar, and in a moderately warm place. The flowers should be covered by the glycerin.

CURE FOR NEURALGIA.—Half a drachm of sal ammoniac in an ounce of camphor-water, to be taken a teaspoonful at a dose, and the dose to be repeated several times, at intervals of five minutes, if the pain be not relieved at once.

SOLDER FOR BRASS INSTRUMENTS.—An alloy of 68.26 parts of brass, 17.41 of zinc, and 4.33 of silver, with the addition of a little chloride of potassium to the borax, is recommended as the best solder for brass tubes which have to undergo much hammering or drawing after joining.

SOLDERING SOLUTION.—Two ounces muriatic acid, in which as much zinc is dissolved as it will hold, to which add half an ounce sal ammoniac. Clean the metal well and the solder will run and adhere to any part of the metal to which the solution is applied. It will also solder brass and steel together.

TO CLEAN STEEL PENS.—When the pen has been written with, and appears spoiled, place it over a light (a gas light for instance) for a short time, say a quarter of a minute, then dip it in water, and it will be fit for use. Also any new pen which is too hard to write with will become softer by being heated in the same way.

TO BEAUTIFY THE TEETH.—Dissolve two ounces of borax in three pounds of boiling water, and before it is cold add one teaspoonful spirits of camphor, and bottle for use. A teaspoonful of this mixture, mixed with an equal quantity of tepid water, and applied daily with a soft brush, preserves and beautifies the teeth, extirpates all tartarous adhesion, arrests decay, induces a healthy action of the gums, and makes the teeth pearly white.

Mining Share Market.

The San Francisco Weekly Stock Circular of June 22, gives the market rates of mining stock as follows:

The mining share market has been somewhat irregular during the week past. Some stocks met with a material decline, while others have been well maintained at a slight advance. Transactions at the Board have assumed vast proportions, and are largely in excess of all former operations. The bullion product of the various claims is constantly on the increase, dividends are more frequent and regular, and assessments far less numerous.

SAVAGE—declined from $4,400 to $4,200, improved to $4,350, and closed at $4,225, at 30 days. The approximate value of 2,350 tons of ore extracted from the mine during the week ending June 15th is stated at $103,879, or an average of $44.20 per ton It is estimated that this amount will produce a net profit of $60,000.

YELLOW JACKET—has been dealt in at a considerable decline, opening at $2,000, gradually receding to $1,790, rallying to 81,815, dropping to $1,650, and closing at $1,700. From the 1st to the 17th instant, 3,213½ tons of second class ore was taken from the mine, and during the same period the yield of bullion amounted to $79,263.72.

GOULD & CURRY—advanced from $660 to $690 per foot, receded to $650, then sold at $700, buyer 30, and closed yesterday at $640.....BELCHER has been more active than usual, advancing from $500 to $575, receding to $425, and at the close selling at $440.

KENTUCK—opened at $560, receded to $515, then sold at $525, seller 3, and closed at $525. The reciepts of bullion by this company since our last reference aggregated $23,030.55, which, added to the previous returns made in the present month, shows a product of $45,862.72 from the 1st to the 17th inst. During the seventeen days of the current month, 1,321¼ tons of ore were extracted from the mine.

CHOLLAR-POTOSI—has been actively dealt in at a decline, receding from $467.50 to $425, advancing to $530 under large sales, falling to $440, and closing at $480.

OPHIR—sold to the extent of over 200 feet at a recession from opening rates, ranging from $327.50 to $265, and closing yesterday at $290.

OVERMAN—has been the feature of the market since our last reference, and under the strange action of the majority of the Trustees sold at extremely fluctuating rates. Some 1,800 shares changed hands in the Board within a range of $319@180, closing at $200.

IMPERIAL—realized $196@190, closing yesterday at $194. The bullion returns from the 1st to the 19th amounted to $32,500.

PATENT CLAIMS.

Pertaining to Gas, Mining, Petroleum, Water etc.

FOR THE TWO WEEKS ENDING AUGUST 2, 1867.

66,670.—STEAM GENERATOR.—Henry Bevis (assignor to himself, Thomas H Foulds and W. D. Dalton) Cincinnati, O.

I claim the steam chamber C, and water chamber B, connected by one or more annular series of ascending tubes or ducts D, immediately surrounding the fire, and having downwardly discharging terminations G, above the crown sheet, and by one or more outer annular series of descending ducts E, having their inlets flush with the top of the crown sheet, for the purpose set forth.

66,694.—WATER INDICATOR FOR BOILERS.—William R. England, Milwaukee, Wis.

I claim 1st, The arrangement of the whistle lever L, connecting rod K, index hand H, lever F and float E, substantially as herein set forth.

2d. I claim the arrangement with reference to first clause of the claim, the glass tube O, and whistle M, substantially as herein set forth.

3d. I claim the arrangement of the adjustible collars m and n, with the whistle lever L, substantially as herein set forth.

66,718.—APPARATUS FOR SIFTING COAL.—Samuel Langmaid, Lawrence, Mass. Antedated June 28, 1867.

I claim the pivoted tilting box A, constructed substantially as shown and described in combination with the gate E, crank shaft F, cams G, and screen H, with or without the springs h, the whole arranged to operate substantially as and for the purpose set forth.

66,735.—WATER WHEEL.—I. F. Quimby, Rochester, New York.

I claim the cap E, in combination with wheel g, having buckets h and I, the latter being curved downward at the bottom the whole being arranged substantially as and for the purpose set forth.

66,670.—MATCH-LIGHTER.—William Adamson, Philadelphia, Pa.

1st. I claim a match-lighter consisting of a strip of paper or other material, part of which is sanded or otherwise roughened, and part left plain for the purpose specified.

66,777.—APPARATUS FOR CARBURETTING GAS AND AIR.—J. F. Barker and C. N. Gilbert, Springfield, Mass.

1st. We claim the heating of the fluid of any carburetor used for the purpose of carburetting air or gas, by means of a heated fluid the same being circulated in pipes and radiators through the carburetor and heater, substantially as herein deresibed and set forth.

2d. The heater B, having a case B', filled with a non-conducting substance; and the coil m', when used in combination with radiators placed inside a carburetor, substantially as herein described and for the purpose set forth.

3d. We claim in combination with a carbureting apparatus, a condenser, substantially as herein described so as to cool the gas after being carburetted and before it passes into the distributing pipes, for the purpose hereinbefore specified.

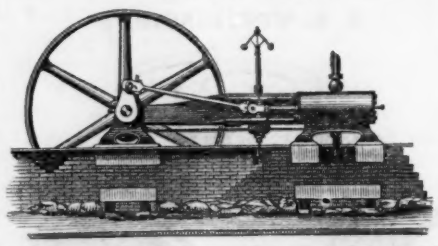
4th. We claim the use of the condeuser C, in combination with the carburetor A, the radiators c and T, and the heater B, when constructed substantially as described and for the purpose herein specified.

5th. The valae H, h, in combination with the pipe a, radiators c and T, and carburetor A, all constructed substantially as described and for the purpose herein specified.

6th. The heater B2, having the space O, between the two cylinders I and I' with the inverted cone n, having its base open and attached to the upper part of said cylinder I, so that the interior of said inverted cone n, shall communicate with the space O, all constructed and operating substantially as herein set forth and described.

ERIE BASIN IRON WORKS,

MANUFACTURERS OF



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WANTED—A SITUATION BY A RELIABLE and Experienced Workman of nearly 30 years' service in every branch of Gas and Steam Fitting, and the erection of every kind of Gas Works generally. He can superintend the working departments appertaining to Gas-Light Companies, having a thorough knowledge practically. No objections to any State in or out of the Union. Letters addressed to me at the Post-office, Augusta, Ga., will receive immediate attention. WM. J. CONLEY,

50-tf care of C. A. ROBBE, Plumber and Gas Fitter.

WANTED—Second-hand Purifiers about eight feet square—must be in good condition. State particulars and price, and address the GAS-LIGHT JOURNAL, No. 22 Pine street.

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Formerly Chemical Examiner in the U. S. Patent Office, may be employed professionally as a SCIENTIFIC EXPERT. Geological Examinations and Reports, Analyses and Assays etc. etc., Practical Advice and Investigations in the CHEMICAL ARTS and MANUFACTURES. Invention and Examination of new chemical methods and products. Address 26 Pine street, rooms 35 and 36. Always in at 1 P. M.

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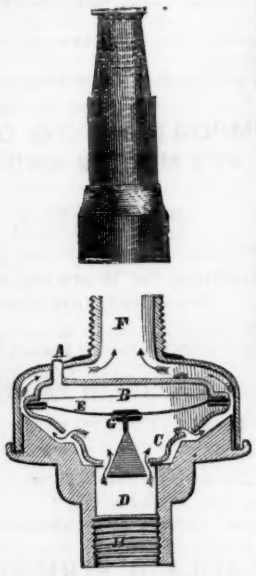

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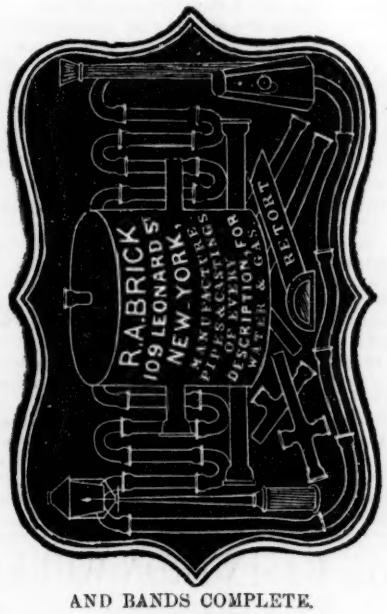

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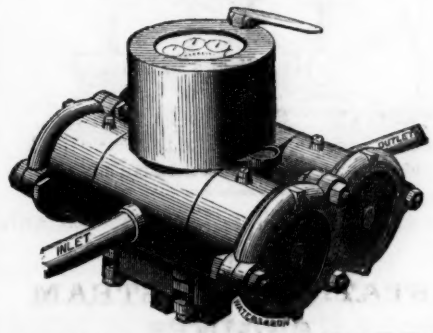

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EDITORS AND PROPRIETORS.

FRIDAY, AUGUST 2, 1867.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

SUBSCRIBERS would confer a favor upon us by remitting CHECK or POST OFFICE MONEY ORDERS, as we are frequent losers where money is enclosed in letters.

☞ NEWS AGENCY.—The American News Company, 119 and 121 Nassau street, New York, are agents for this Journal. News-dealers will please send orders to them.

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NOTICE.

☞ Parties having back volumes of this Journal from No. 1 to 7 inclusive, to spare, will please communicate with us, stating the price. Also No. 7, Volume VIII.

Answers To Correspondents.

E & G of Pa.—The Boston and Cambridge Gas Cooking Stove Company has its office in Boston, we believe. The Rev. Dr. Haskins, of Cambridge, Mass., is the inventor, and will furnish any information you desire.

L. A. of Iowa.—You do not forfeit your right to take out a patent by delaying the application, providing such delay does not amount to an abandonment of the invention to the public. It is dangerous for inventors to delay their application unnecessarily, as by such neglect, they often become involved in troublesome and expensive interference cases.

J. A. B. of Mo.—India-rubber will not stand the action of coal gas any length of time. The hydrocarbon vapors which all coal gas contain act to dissolve the gum. Vulcanized rubber and gutta-percha are not so readily acted upon.

G. L. of IND.—The person who exercises the mental effort, termed invention, is the inventor, not the mechanic who simply carries out the idea; one plans or invents, the other executes.

S. A. N. of OHIO.—Petroleum will undergo destructive distilation if subjected to a sufficiently high temperature, and be converted in whole or in part into permanent gases.

—It appears from recent experiments conducted by the London Pneumatic Company, that 120 tons of goods can be sent through their 18 miles of tubes every hour, at a cost less than one penny a ton per mile.

—At Lynn, England, the water-works supply is constant, and the water is furnished to consumers by meter, at about 14 cents per 1,000 gallons.

OBITUARY.

It has become our painful duty to record the death of Col. J. W. BRYANT, senior editor of this Journal, who died at 30 minutes past 10 o'clock, A. M, on the 26th ult, at the residence of Mr. Rundell, Bloomfield, N. J. He had been suffering, more or less, for the past three years from that insidious disease, consumption. He was 56 years of age at the time of his death. His remains were temporarily placed in the cemetary at that place, but will be removed eventually to his former home in the South, where his family now are.

Col. Bryant was formerly a resident of the South, where his talents, ability and energy gave him a leading political and business position, and his excellent personal qualities had endeared him to a large circle of friends.

A short time previous to the war he went to Havana, Cuba, for the benefit of his health, where he engaged in business, and finally established and edited a paper in the Spanish and English languages, called the *Cuban Messenger*, until 1862, when he came to this city. In 1864 he purchased the AMERICAN GAS-LIGHT JOURNAL, then in its sixth year, of its founder, John B. Murray, Esq, and continued to be senior editor of the Journal with success, until a short time before his death.

He possessed a large landed property at the South, which the ravages of war had, temporarily, very much depreciated, but he was looking hopefully forward to a better time, when he could return there, if only for a short period, to recuperate his health, which the inclemency of a northern climate seemed to forbid while here.

In his private life he was a gentleman, amiable and generous, and posse-sed of rare social qualities. He leaves many warm personal friends here to mourn his loss, aside from the sad bereavement to his family and friends at the South.

His death is a source of sincere regret to us, who had by our associations, learned his private character and worth, and esteemed him highly for the many amiable, honorable and manly qualities he possessed.

Singularly genial, sympathetic and youthful in all his impulses, he boldly threw the heart of a boy into the wisdom and soul of a man—until he seemed the perfect incarnation of what age should be—the teacher and companion of youth; and among the young were entwined some of his dearest associations, while from them the pleasantest memories will be given to one all could look to as a father or a friend.

Through his death sorrow will come to all who were privileged to know him, for his life was beautifully made up of good deeds and kind thoughts, while his example was the rarest and most divine of earth's manifestations—a living charity.

THE GAS QUESTION IN CINCINNATI.

Since our first article in regard to this matter, we have obtained more correct and definite information, which we therefore place before our readers as concisely as possible.

The proposed purchase of the gas-works by the city has met with what appears to be a succession of serious, if not endless delays, owing to the commencement of a suit now pending in the U. S. Circuit Court, from which it will probably be appealed to the Supreme Court at Washington. This suit is instituted upon the following grounds: The contract enabling the city to purchase the gas-works, prescribes that the value shall be ascertained by five "disinterested" appraisers, two to be named by the city, two by the company, and these four to choose the fifth. As before stated, Miles Greenwood and Henry Kessler were designated by the city, and they have been unable to agree with the appraisers selected by the company, in selecting the fifth appraiser. A certain Sophia C. Dean, of New York, who claims to be the owner of $84,000 of the Gas Company's stocks, in the mean time has filed a bill in the U. S. Circuit Court, for an injunction against the appraisement, because, as she maintains, Messrs. Greenwood and Kessler are not "disinterested," but on the contary, being tax payers and gas consumers, interested and partial. Objection is also made to Mr. Kessler, that he is a city officer, being the trustee of the water-works, and therefore so much the more identified with the city interests.

The four appraisers have adjourned till the 30th of October in consequence of this suit, or until the decree of the Court is made known. It is not likely this will be soon. The defeated party will, most likely, appeal to the Supreme Court at Washington when, owing to the immense amount of accumulated business, it will be impossible to foretell the end of the controversy. Meanwhile the city has no protection against the Gas Company, which, in such event, may increase the price of gas to the old standard.

The city council, we are informed, intend to pass, or have passed, an ordinance to reduce the price of gas to $1.75 per 1,000 cubic feet, under the right conferred upon the city by the existing laws upon the statute book, whereby they are empowered to regulate the price of gas. There is such a law, but it is contended that it cannot be applied to cases regulated by previous contract. Under the Constitution of the United States, no legislative body can pass any law by which the obligation of a contract is impaired. It is contended by the city that the terms for which the contract was made has expired. On the contrary, the Gas Company object on the ground that the ordinance of the year 1841, from which the Gas Company derives its rights, provides the same shall last for "the term of twenty-five years, and afterward until the gas-works have been purchased by the city." And since the purchase has not yet been made, the rights of the company under the contract remain, and the mere passage of an ordinance cannot alter the condition of things.

Should the city council press this matter to the test the Gas Company will not submit. It will, most likely, invoke the decision of the Supreme Court, and another costly and protracted lawsuit will therefore be inaugerated. Meanwhile the price of gas will be no cheaper than heretofore, and possibly not so cheap; for the company may, *ad interim*, choose to indemnify itself for the costs of suit by increasing the price of gas.

Another chance for litigation arises from the question whether the appraisers must be unanimous, or may act on a majority vote. And still another, on the question whether the material and gas-works only, or the franchise and good will also, shall be appraised. In the meantime the public are not benefitted. The community can have no security against capricious prices, and charges for gas on the plan now proposed, for years perhaps.

It is quite probable, however, if the company would agree to more liberal terms than heretofore, when the gradual reduction in the price of coal and labor may justify it to do so, public sentiment would induce an assent to them in order to bring the present unsatisfactory state of things to an end.

The financial condition of the city is said to be not over strong, and the gas stock will bring only 85 cents on the dollar—a discount of 15 per cent., which amounts to $450,000 on three millions required, which will be a positive loss to the city, on which interest must be paid, and in time redeemed.

Under all these circumstances it is likely time and

reflection will cool off the purchasing mania of the city council, and they will wait for a more propitious moment to embark in the gas business, and save the city thereby from the very costly luxury and glorious uncertainty of endless litigation.

Since writing the above we have been put in possession of a memorial of the Cincinnati Gas-light and Coke Company, addressed to the city council of the city of Cincinnati, remonstrating against the passage of the pending ordinance before that body, to reduce the price of gas to private consumers to $1.75 per thousand cubic feet, stating in substance that a similar attempt was made in 1853 to reduce the price to $2.25, which was afterwards decided to be illegal, and states that the company's counsel has advised that the proposed ordinance is likewise illegal, as established by the former decision in the District Court, upon the ground that the original contract between James F. Conover and the city in 1841, "no limit was placed upon the price of gas to be sold to private consumers, but only upon the public lamps." The memorial gives notice that the city will be liable to the company for damages occasioned by its passage.

It goes on to say, however, that the company is willing and hereby renews the offer made in March last, "to reduce the price of gas to $2.25 per thousand cubic feet." We are satisfied, upon reading the opinion and decision as presented, that the Gas Company are right, and that the best course for the city will be to accept the proposition of the company, to take the gas at $2.25, which is not unreasonable as prices are now ruling, for coal, labor and other expenses contingeut upon the manufacturo of gas.

PETROLEUM FUEL FOR STEAM BOILERS, ETC.

We had the pleasure to-day of examining the apparatus invented by Col. Henry R. Foote, for burning crude petroleum for generating steam, in practical operation. This experiment makes it conclusive to our mind that a new era has commenced in the practical science of combustion where liquid fuel is to be employed. The principles on which the apparatus is constructed are plain and simple, and the combustion and utilization of the fuel more perfect than we have ever seen in a steam boiler or elsewhere, except the laboratory, perhaps. To our mind there is no doubt it will come into early and general use on locomotives, steamboats, and for other purposes, which it is easy to conceive.

The process consists in supplying a small retort in the furnace of the boiler with petroleum, superheated steam, and air. The oil is led through a small pipe by gravity to the retort, from a reservoir at a distance. The steam is supplied by the boiler, and it is claimed to be superheated and deoxydized on its passage to the retort, and the air is injected by an air-pump worked by the engine. The steam is superheated and deoxydized by passing through a red hot coil of pipe filled with iron filings or shingle nails. This mixture issues from a number of burners distributed over the area of the furnace, and so arranged also, as to heat the retort and coil of pipe before mentioned. The pipes are about three-quarter inch gas-pipe, radiating from the retort, the ends turned upward, into which is inserted a fluted conical plug of cast iron, about three inches long, ending at the top in a disk of the same metal about three inches in diameter.

These plugs, disks, pipes and retort are kept at a red heat by the action of a fire, and serve the purpose of spreading the gases as they inflame and issue from the pipes, and distribute it throughout the furnace. By the aid of stop-cocks in each of the three pipes, conveying petroleum steam and air to the retort, the character and intensity of the fire can be regulated and adjusted instantly and at pleasure; or the fire can be immediately extinguished and relighted so long as the pipes and plugs remained red hot. The apparatus is first started by heating the retort with paper or kindlings placed beneath. The flame produced is a blueish white flame without smoke, denoting perfect combustion, and of a very high temperature.

Oils, like solid fuel, have always labored under the disadvantage of imperfect combustion and utilization of the heat evolved. In the process of Col. Foote the admixture in a close and highly heated vessel of the superheated steam or hydrogen, petroleum vapor and atmospheric air, which renders the theoretical quantity required for complete combustion, practically obtainable and sufficient. The many advantages of this invention are too numerous to enumerate, but will be apparent to all engineers and scientific men. In steam navigation and locomotives it seems to be peculiarly advantageous.

PETROLEUM IN STEAMERS.

Recent experiments were made by the U. S. Navy Department at Boston, on board the iron screw steamer "Palos," 2, Captain Wallace, wherein it showed an immense saving. Instead of 20 men to manage the furnaces, and the crowd of coal passers, etc., it only required three men and obtained a speed of nine and a half knots per hour against seven and eight, obtained with coal. One pound of oil was found to equal eight pounds of coal, which will give an idea of the gain to be obtained in conveying capacity, and the much longer voyages steam ships can make without replenishing fuel. Interesting experiments are being conducted daily with this apparatus, on the Battery, under the auspices of the inventor and Stillman B. Allen, Frank A. Allen, Jonas H. Winsor and Richard D. Winsor.

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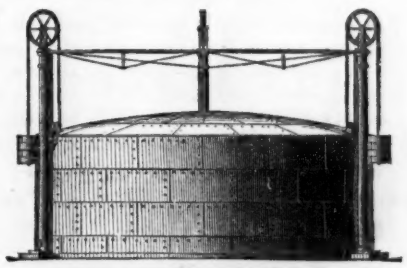

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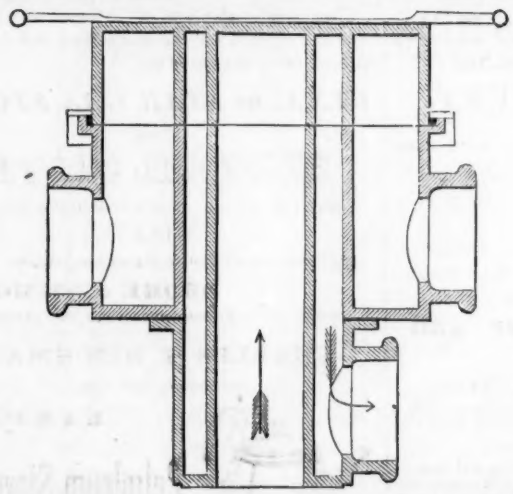

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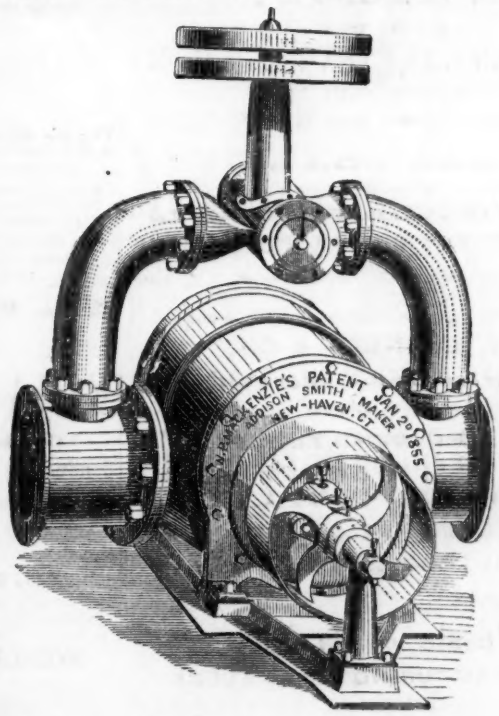

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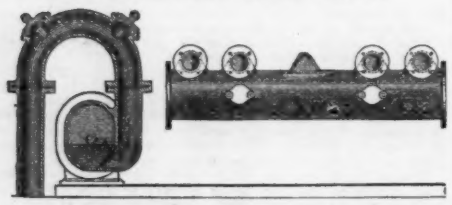

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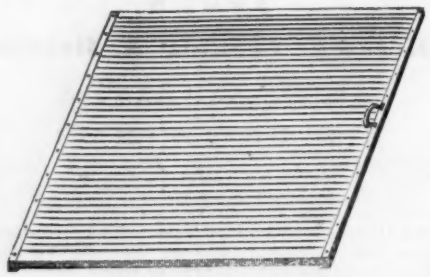

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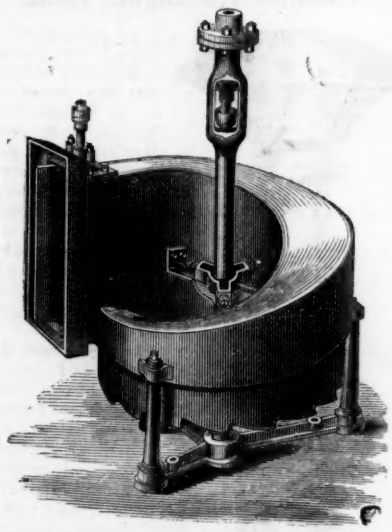

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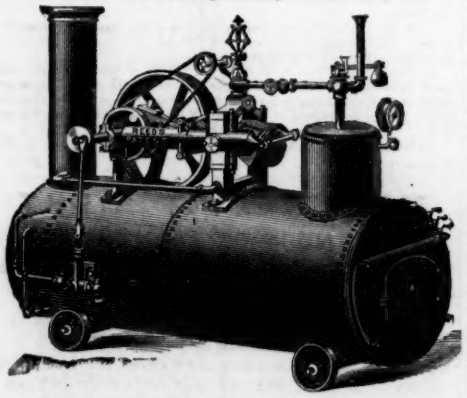

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It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency,

389 Broadway, N. Y.

Send for a Circular—Agents wanted.

DALTON KNITTING MACHINE CO.,

137] 537 Broadway, N. Y.

WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance. it Binds, Hems, Tucks and Sews on the band at the same time, and inf acc, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency 389 Broadway, N. Y.

Below we give a few prices:

No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil-Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

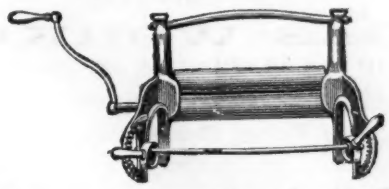
WEED SEWING MACHINE Co.,

136. 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog-wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*

That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.

That wood soaked in water will *swell, shrink,* and *split.*

That wood-bearings for the shaft to run in *will wear out.*

That the Putnam Wringer, with or without cog wheels, will *no tear the clothes.*

That cog-wheel regulators are not essential.

That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January*, 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any*, to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.

Sample Wringers sent, express paid, on receipt of price.

Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,

13 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O.

☞

C. GEFRORER,

MANUFACTURER OF

Gas Heating Apparatus

OF EVERY DESCRIPTION,

Gas Burners, &c.

No. 529 COMMERCE STREET,

PHILADELPHIA, PA.

Burners for Wood, Coal Oil and Water Gas.

Gas and Lava Burner Tips

Constantly on Hand

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice President. RICHARD MERRIFIELD, Secretary and Treasurer

Trustees.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS AND REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishment, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by

HARRIS & BRO., No. 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.

JOHN C. CRESSON, Engineer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.

G. S. HOOKEY, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanship all we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, BIRKINBINE & MEARS.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those imported from Europe, or made by any of the manufactur in the United States. Respectfully Yours GEORGE WIEGAND, Inspector of Gas Fittings, Philadelphia

C. GEFRORER,

MANUFACTURER OF GAS BURNERS,

529 Commerce Street, Philadelphia, Pa.

Burners for Wood, Coal Oil, and Water Gas. Brass and Lava Burner Tips Constantly on Hand.

GROVESTEIN & CO.,

PIANO FORTE MANUFACTURERS,

499 BROADWAY, NEW YORK.

THE ATTENTION of the public and the trade is invited to our New Scale, Seven Octave, Rosewood Piano Fortes, which for volume and purity of tone are unrivalled by any that have hitherto offered in this market. They contain all the modern improvements, French Grand Action, Harp Pedal, Iron Frame, Over-strung Bass, etc., and each instrument, being made under the supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"
RECEIVED THE HIGHEST PREMIUM AT THE
CELEBRATED WORLD'S FAIR.

Where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvement we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES

No. 1,	Seven Octave,	round corners,	Rosewood, Plain Case,	$275
No. 2,	"	"	" Heavy Moulding	300
No. 3,	"	"	" Louis XIV style	325

a fac-simile of the accompanying cut.

TERMS—Net Cash, in current funds Descriptive circular sent free on application.

MORRIS, TASKER & CO.,

PASCAL IRON WORKS

[ESTABLISHED 1821.]

PHILADELPHIA,

Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

Gas and Steam Fitters' Tools, &c.

STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

J. VAUGHAN MERRICK, W. H. MERRICK,
JOHN E. COPE.

SOUTHWARK FOUNDRY,

FIFTH & WASHINGTON STREETS,

PHILADELPHIA.

MERRICK & SONS, Engineers,

MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron, Line Sieves for Purifiers, Hoisting Machines for Lifting Purifier Covers.

Address— MERRICK & SONS,
5th and Washington Sts, Philadelphia.

S. FULTON & CO.,

(Successors to Colwell & Co.)

Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

SAMUEL FULTON, THEO. TREWENDT

TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

POOLE & HUNT,
BALTIMORE, MD.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its banches

561 Broadway,
NEW YORK.

THE WOODWARD
Steam Pump Manufacturing Company,

MNUFACTURERS OF THE WOODWARD PATENT IMPROVED

SAFETY STEAM PUMP,

—Adapted for Mining and Fire Purposes—and
Steam, Water & Gas Fittings of All Kinds.

Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE, BOILER TUBES, etc.,

Woodward Building, 76 and 78 Centre Street,

corner of Worth street, Formerly 77 Beekman Street, *New York.*
58 GEO. M. WDDOWARD, Pres't. 64

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
MANUFACTURER OF
Wet and Dry Gas Meters,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
205 1-2 Walnut st., Philadelphia, Pa.
Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

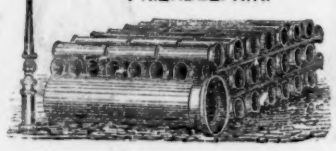
THE AUBIN BALLANCED
VALVE WATER METER,
(Used also for Oils and Liquors)

Is now in use by many City Water Cos., because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by H. Q. HAWLEY, Albany, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
No. 40 Cortland street,

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.



Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salsroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather to the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbers.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,
COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2. Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably Cash on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

GAS-BURNERS.

WIGHTMAN BROS.,
IMPORTERS AND
SOLE AGENTS
For the United States and Canada, of
SCHWARZ'S
GERMAN LAVA GAS-TIPS
And proprietors of Winchester's Improved
LAVA TIP GAS BURNERS,
No. 25 Kilby Street,
BOSTON, MASS.

T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS,
And Importer of SCOTCH TIPS,
224 and 226 West 21st street,
formerly No. 447 BROOME ST., New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,
Manufacturer of
GAS-BURNERS,
For Lighting and Heating Purposes.
GAS HEATING AND COOKING APPARATUS; FITTERS' ROVING APPARATUS, &c.
529 Commerce st., bet. Market & Arch, Philadelphia

JOSEPH LEES,
Sole Agent for the sale of
Thompson's Gas Controller
in the States of
CALIFORNIA AND OREGON,
San Francisco, Cal.

Carrington & Co.'s
GENERAL
PURCHASING
AGENCY,
In Connection with all the Expresses
No. 30 Broadway,
NEW YORK.

Established 1854.

Purchases to order any article wanted from New York, or Europe, for ladies' or gentlemen's use or wear,---comfort or luxury,---from a cameo to a cashmer, a seal ring to a steam engine.

Goods purchased at current City prices, and forwarded by Express or as directed.

Commission, Five Per Cent

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

THE HAVANA
MEXICAN & BRAZILIAN
EXPRESS.

CARRINGTON & CO.
30 Broadway.

Express for HAVANA and ISLAND OF CUBA by regular steamships weekly.

Express for MEXICO and VERA CRUZ on the 10th and 16th of every month.

Express for ST. THOMAS, BAHIA, and RIO DE JANEIRO each month.

Packages received for United States Brazil Squadron.

Freights should be sent to our office day before sailing of steamer, with invoice, contents and value.

FINKLE & LYON'S
New Family
SEWING MACHINE
Should be known in
IN EVERY TOWN.

To accomplish this at once and save the expense of a *Travelling Agent*, we offer thus, viz:

Any one sending us orders for two machines shall receive one machine free of charge. This proposition cannot avail after we have appointed a local agent in the town.

We have now completed our *new manufacture* at a cost of some $200,000—introducing *new patents*, and such important improvements, that without fear we are able to offer the following stringent guarantee, viz: After a fair trial, if any purchaser does not prefer the FINKLE & LYON FAMILY SEWING MACHINE to any other, he can return it and have back his money.

This machine has taken many of the HIGHEST PRIZES; *is less complicated than any other first class machine; does a wider range of work without changing; requires no taking apart to clean or oil, no "lessons" to set needle, regulate tension or operate machine.*

Our new Manufacturing Machine is sold on the same terms as the Family Machine.

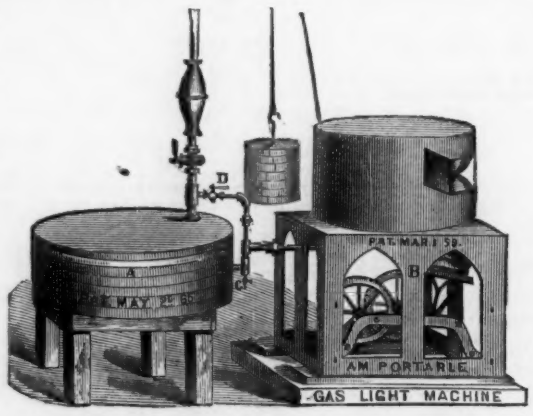
Please send for a circular with samples of sewing.

Finkle & Lyon S. M. Co.
No. 581 BROADWAY, NEW YORK.

THE AMERICAN
AIR GAS-LIGHT MACHINE.
HURD, WARREN & SWIFT'S PATENT.

This ingenious PORTABLE GAS-LIGHT APPARATUS is the invention of Daniel Hurd, of Chicago, and patented by Warren & Swift, May 2d, 1865, and as a *Carburator* for air, for illuminating purposes, stands at the head of any known. Combined with a beautiful clock work, for blowing uniform currents of air (J. Griffin's Patent of March 1, 1859,) it constitutes a Portable Gas-Light Machine, at once adapted to lighting dwellings, halls, saloons, churches, railroads, steamboats and public buildings. It possesses the following advantages:

1. The machine is portable, and may be placed in all kinds of buildings, railroad cars, steamboats, etc., without occupying much space; and a boy 12 years old, or house servant, may operate it. It produces gas without fire or heat, and is adapted to both warm and cold climates. Two minutes' attention each day will run it for 24 hours.



2. It affords a clear, brilliant and agreeable light, and is equal in this respect, to coal gas.

3. It is the cheapest light known. The hydro-carbon used to supply it is most abundant and cheap. The gas made by this apparatus costs about 75 cents *per thousand cubic feet.* The hydro-carbon is worth 16 cents per gallon. Two and a half gallons will make 1000 feet of gas. One thousand cubic feet of this gas is equal to about 1,200 feet of coal gas. It may be used, therefore, for cooking and heating purposes, at a great saving over ordinary fuel.

All orders for machines, piping and gas fixtures suitable for buildings, where our machines are wanted, or for hydro-carbon, (warranted,) may be sent to "MONROE & SMITH, Agents AMERICAN PORTABLE GAS LIGHT COMPANY, 31 Courtlandt street, New York."

Careful and skillful men will be sent by the company to set up the machines, and do the necessary piping, etc., at the purchaser's order. Bills for the machines, and work of putting them in, to be paid on completion of the work. Persons ordering machines will be careful to designate how they wish them shipped. The machines weigh about 400 lbs. each. Each person buying a machine should order a barrel filled with hydro-carbon. A barrel will last an ordinary house six to twelve months.

"THE IMPROVED CARBURATOR" is about eight inches square. It is connected with the gas pipes, between the meter and the burners, near the first. It is employed in connection with coal gas and the hydro-carbon, thereby increasing the illuminating power of the gas, besides making it more steady and pleasant to the eye.

The prices of our machines will vary according to the materials used in their construction, and the number of lights desired—from $75 to $3,000.

We select from among several notices, the following testimonials from the Press, and from practical men now using the "AMERICAN PORTABLE GAS MACHINE":

"The American Portable Gas Machine has the following qualities: It can be set up in any public house or private dwelling, is simple in construction, and furnishes a brilliant light, at a cost of only about *one dollar* per 1000 cubic feet, and you only pay for what you get."—*Chicago Tribune.*

* * * "It is simple in construction, perfect in operation, and furnishes a light equal to that of the best coal gas, at less than one-third its cost. The same pipes and fixtures are used as with the common gas."—*Chicago Evening Journal.*

* * * "The time is not far distant when every country seat and village church will be lighted by this admirable contrivance."—*Pittsburgh (Pa.) Presbyterian Banner.*

"We have examined the American Portable Gas-Light, and are satisfied that it is superior to anything of the kind which we have any knowledge."—Prof. Blayney, Assayer of Illinois.

* * * "I take pleasure in recommending it to those who are in want of a cheap and brilliant light."—John Raber, Chicago, Ill.

☞ Every machine warranted to give entire satisfaction. State and County Rights for sale. Energetic and well recommended Agents wanted in every city and county of New York and New Jersey.

WATER FOR ST. LOUIS.—A St. Louis exchange says: The public will be glad to learn that the Board of Water Commissioners have resolved to commence work immediately. They have determined upon a plan, have secured all the property necessary, and will immediately set three hundred men at work preparing a new reservoir. As all know this is precisely the one thing needful in St. Louis. So long as all our water must come from the present reservoir, originally too small, and now half filled with mud, the water supplied to the city will be neither pleasant nor wholesome. Under the energetic management of the Board, we hope to see the work prosecuted with great rapidity and vigor. Indeed, we believe at least a thousand men could at once be employed to advantage, and probably at an actual saving to the city, for the expense of directing and managing a large force of workmen is not much greater than is required for a smaller. If the Board find it practicable to set a much larger force at work, there are many idle hands in the city at present who will be glad of employment, and all the people of St. Louis will heartily sustain the Board in efforts to give us pure and wholesome water as quickly as possible.

Miscellaneous Items.

GAS.—The illuminating power of gas becomes impoverished by travelling long distances, therefore it should be manufactured as near as possible to the point of consumption; and for this and other reasons a series of detached gas works is to be preferred to a single monster work situated at some distance from the place of supply.

QUICKSILVER MINE.—The San Jose (Cal.) *Patriot* says: An exceedingly rich mine of cinnabar has been discovered on the ranch of Chapman, situated about 3½ miles south of San Jose. There is a solid ledge about twelve feet wide and eight feet thick between the walls of rock, which grows richer as the excavators descend upon it. They have gone down on the ledge about 150 feet. The ore is being worked at the Guadalupe mine.

CALIFORNIA OIL WELL.—The oil well of the California Petroleum Company, at Ajai Rancho, in Santa Barbara county, which burst out with great violence in May last, and projected ac olumn of oil sixty feet into the air, from a depth of 550 feet, continues to flow steadily. Advices to July 12th state that the well is improving in production, at the rate of 100 barrels per day, and the oil is 24° in density.

CONSUMPTION OF GAS IN LONDON.—The aggregate of the gas sold by the thirteen metropolitan companies in 1866 amounted to 8,653,517,551 cubic feet, of which 5,475,280,800 feet were common gas only, 2,839,948,751 feet common and cannel gas, and 333,388,000 cannel gas only. The cost of each kind of gas per 1,000 feet was worked out under three heads, viz., coals, working expenses and dividends, and the capital employed was shown to average $31.75 per ton of coal carbonized.

CROTON MATTERS.—The Croton Aqueduct Board are constantly working at Carmansville to supply with water that portion of the city above 136th street. There is to be a high tower at this place. At Boyd's Corner, Putnam county, 7½ miles from the city, a new reservoir, intended to supply Croton Lake, is being erected. This reservoir will cover an area of 303 acres, and will have a capacity of 3,369,206,857 gallons. The dam will be 700 feet in length, 64 feet in depth, and 600 feet above tide-water. It is twenty-three and three quarter miles above Croton Dam.

ACTION OF CARBONIC ACID.—While workmen were engaged in re opening and repairing the coal mines of Bow Buveur, at Jemeppe, they came upon a gallery communicating with the lower ladders, where they discovered seven bodies of the unfortunate workmen, who three months before were imprisoned while making their way to the surface. The bodies were completely mumified, the shrivelled flesh adhering to the bones. This phenomenon is attributed to the abundant exhalations of carbonic acid gas in the gallery.

GAS-LIGHT IMPROVEMENT.—Any of our readers who burn gas can test for themselves a simple device by which a Mr. Scholl, of London, proposes to increase the illuminating power of a common gas burner by more than 50 per cent. Hold a strip of thin sheet brass or other metal, one third or half an inch wide, in the center of the flame, splitting its thickness (not its breadth) and nearly touching the two holes whence the gas issues, so as not to obstruct the passage, but to divide the jets and check the velocity of their upward current. The division and the check will favor a more intimate access of oxygen to the gas, and hence a more perfect and brilliant combustion. Mr. Scholl uses a platinum strip resting in slits in a brass ferrule fitted over the burner tube.—*Jour. Board of Arts.*

GAS.—In his recent lectures on coal gas, Dr. Frankland said: Representing the London gas by 12, that of Birmingham is 15, Manchester and Liverpool are 22, Inverness is 25, Edinburgh, Glasgow and Greenock are 28, Paisley and Hawick are 30, and Aberdeen is 35. From this it appears that the illuminating power of London gas is the lowest of all, and that in some towns and cities in Scotland the gas gives twice as much, and in one instance nearly three times as much light as in London. Besides, the more the Londoner tries to increase his light the more does he contaminate his atmosphere. Dr. Frankland says that London gas was better sixteen years ago than at present; that the new system of purification used by the companies leaves the gas weak and deleterious.—*Builder.*

FIRE ANNIHILATOR.—A number of gentlemen connected with Insurance offices, and others, assembled at the Battery on Wednesday afternoon (24th ult.), to witness experiments with Levy's Improved Patent Fire Extinguisher. The machine consists of a cylinder, containing about six gallons of liquid preparation, which is ejected at will, through a small rubber tube. When once charged it is ready for immediate use at any time, and the liquid will project itself with its own power a distance of forty feet. A pyramid was formed of a number of tar barrels, which were ignited, and soon a fire on a small scale prevailed. The experiment was repeated three times with a similar result, with great applause. Mr. Levy states that the insurance companies have decided to lower the rates of insurance on the swamp foundries supplied with this machine.—*Sun.*

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